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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/077,593	02/14/2002	Yinan Wu	10559-684001 / P13288	1555
20985	7590	04/22/2004	EXAMINER	
FISH & RICHARDSON, PC 12390 EL CAMINO REAL SAN DIEGO, CA 92130-2081			VIGUSHIN, JOHN B	
			ART UNIT	PAPER NUMBER
			2827	

DATE MAILED: 04/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/077,593

Applicant(s)

WU ET AL.

Examiner

John B. Vigushin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 January 2004.
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9-31 is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5) ☒ Claim(s) 1-7, 9-15 and 25-31 is/are allowed.
6) ☒ Claim(s) 16-24 is/are rejected.
7) ☐ Claim(s) _____ is/are objected to.
8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The present Office Action is responsive to Applicant's Amendment filed January 20, 2004 (Certificate of Mailing date: January 13, 2004). The Examiner acknowledges the amendments to Claims 1, 16, 21, 23 and 25, the cancellation of Claim 8 and the addition of new Claims 27-31. Accordingly, Claims 1-7 and 9-31 are now pending in the instant amended Application.

Rejections Based On Prior Art

2. The following references were relied upon for the rejections hereinbelow:

Marketkar et al. (US 2001/0024888 A1)*

Benham et al. (US 6,573,801B1)*

Ishibashi et al. (US 6,163,464)*

*Prior Art already made of record in the instant Application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 16-18 and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Marketkar et al.

Examiner's Note: The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

As to Claim 16, Marketkar et al. discloses: a circuit board 300; a bus 112 arranged on circuit board 300 (p.3, [0047]); electromagnetic couplers (flex circuits 354 corresponding to plural sockets 700) defined at locations along the bus 112 (Figs. 2, 3, 13 and 14; p.3, [0044]; p.6, [0086]); base 710 of rigid sockets 700 (Figs. 13-16; p.6: [0086] and p.8: [0106]) having electromagnetic couplers 354 and contacts 750, 760 for connection to contact pads 581-584 of device boards 352 (p.6, [0090]); the rigid sockets 700 being mounted to define interfaces across which electromagnetic coupling of signals can occur between the electromagnetic couplers (lines 311 and 312) defined along bus 112 and the electromagnetic couplers 354 on sockets 700 (Figs. 2, 3 and 14; p.3, [0047]).

As to Claim 17, Marketkar et al. further discloses the sockets 700 are mounted to circuit board 300 by pins of connectors 750 and 760 (Figs. 14 and 17; p.7, [0093]).

As to Claim 18, Marketkar et al. further discloses each of sockets 700 has an electromagnetic coupler 354 for each of a set of signals carried by contacts 750, 760 in base 710 of sockets 700 (Figs. 2, 3 and 14; p.6, [0088]).

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As to Claim 21, Marketkar et al. discloses: a circuit board 300; a bus 112 arranged on circuit board 300 (p.3, [0047]); electromagnetic couplers (flex circuits 354 corresponding to plural sockets 700) defined at locations along the bus 112 (Figs. 2, 3, 13 and 14; p.3, [0044]; p.6, [0086]); base 710 of rigid sockets 700 (Figs. 13-16; p.6: [0086] and p.8: [0106]) having electromagnetic couplers 354 and contacts 750, 760 for connection to contact pads 581-584 of device boards 352 (p.6, [0090]); the rigid sockets 700 being mounted to define interfaces across which electromagnetic coupling of signals can occur between the electromagnetic couplers (lines 311 and 312) defined along bus 112 and the electromagnetic couplers 354 on sockets 700 (Figs. 2, 3 and 14; p.3, [0047]; device boards 352 mounted in sockets 700 (Figs. 13 and 14).

As to Claim 22, Marketkar et al. further discloses the device boards 352 include memory devices (memory module boards 120, 130 and 140 of Figs. 1 and 2 are manifested in the device boards 352 of Figs. 3, 12 and 13; p.2, [0035] and p.3, [0046]).

As to Claim 23, Marketkar et al. discloses: conducting digital signals from memory devices 120, 130 and 140 along a bus 112; at locations along bus 112 (Figs. 1 and 2; p.2, [0035]), electromagnetically coupling the digital signals to rigid (Figs. 13-16; p.6: [0086] and p.8: [0106]) sockets 700 (through electromagnetic couplers 160 comprising flex circuit 354 and bus lines 311, 312 of circuit board 300; Fig. 3 and p.3, [0047]); within the sockets 700, conducting the digital signals to contacts 750, 760, and conducting the signals from contacts 750, 760 to boards 352 plugged into sockets 700 (p.6, [0090]; p.7, [0091] and [0093]).

As to Claim 24, Marketkar et al. further discloses that the signals comprise memory address and data signals (p.2, [0035] and [0036]; p.6, [0093]).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being obvious over Marketkar et al. in view of Benham et al.

Examiner's Note: The applied references have a common inventor and an apparent common assignee with the instant application. Based upon the earlier effective U.S. filing date of the references, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37

CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

I. Marketkar et al. discloses electromagnetic couplers 160, 170 and 180 (Figs. 1 and 2; p.2, [0032]), each comprising the coupling conductors 361, 362 on flex board 354 and the coupling conductors 311, 312 on circuit board 300 (p.3, [0046]), wherein the coupling conductors 361, 362 of flex board 354 and the corresponding coupling conductors 311, 312 on circuit board 300 are linear and parallel to each other. Accordingly, Marketkar et al. do not teach that at least some of the electromagnetic couplers 160, 170 and 180 have a zig-zag configuration.

II. Benham et al. discloses mounting circuit cards to circuit boards and establishing signal connections therebetween and along a circuit board bus by means of electromagnetic couplers 1140 and 1141 (Fig. 11A; col. 6: 14-19), as does Marketkar et al, and further discloses that electromagnetic couplers of the type taught by Marketkar et al. (i.e., linear and parallel to each other) heavily depend on proper placement and mutual alignment within the circuit board, or else the capacitance between the respectively displaced coupling lines is inconsistent and out of the capacitance range constraints required to achieve optimal electromagnetic coupling. Moreover, Benham et al. teaches a solution to this displacement problem which comprises forming the electromagnetic couplers so that they have a zig-zag configuration, said zig-zag

configuration not being sensitive to and dependent upon precise placement and mutual alignment of the respective coupling lines of the electromagnetic coupler, and thereby able to maintain a relatively constant coupling coefficient well within the predetermined design range (Fig. 1 with col.1: 25-38; Fig. 6A with col.3: 14-30 and col.4: 10-26).

III. Since Marketkar et al. are both in the same art of mounting circuit card devices to a circuit board using electromagnetic coupling to transmit signals along a circuit board bus, the identification and solution of the electromagnetic coupling problems caused by displacement and alignment defects in assembling the couplers in the electronic system, as taught by Benham et al., would have been readily recognized in the pertinent art of Marketkar et al.

IV. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the linear and parallel configuration of the coupling conductors in the electromagnetic couplers of Marketkar et al. by replacing it with the zig-zag configuration of Benham et al. in order to enable a relatively constant electromagnetic coupling coefficient in the electronic system of Marketkar et al. by using the much less alignment-sensitive zig-zag configuration of Benham et al., hence, enhancing and ensuring optimal electromagnetic coupling performance in the electronic system of Marketkar et al., as taught by Benham et al.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being obvious over Marketkar et al. in view of Ishibashi et al.

Examiner's Note: The applied reference has a common inventor and an apparent common assignee with the instant application. Based upon the earlier effective U.S.

filing date of the reference, it constitutes prior art only under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 103(a) might be overcome by: (1) a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not an invention "by another"; (2) a showing of a date of invention for the claimed subject matter of the application which corresponds to subject matter disclosed but not claimed in the reference, prior to the effective U.S. filing date of the reference under 37 CFR 1.131; or (3) an oath or declaration under 37 CFR 1.130 stating that the application and reference are currently owned by the same party and that the inventor named in the application is the prior inventor under 35 U.S.C. 104, together with a terminal disclaimer in accordance with 37 CFR 1.321(c). For applications filed on or after November 29, 1999, this rejection might also be overcome by showing that the subject matter of the reference and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. See MPEP § 706.02(I)(1) and § 706.02(I)(2).

I. Marketkar et al. discloses circuit boards 352 mounted to a backplane circuit board 300 and electromagnetically coupled to bus 112 on circuit board 300 through sockets 700 and further discloses that the devices 120, 130 and 140 of Figs. 1 and 2 (manifested in the device boards 352 of Figs. 13 and 14) may, for example, be memory modules (p.2, [0035]) but does not teach boards 352, or any other circuit components that may also be mounted to backplane circuit board 300, as being a processor.

II. Ishibashi et al. discloses circuit boards 5a-f mounted to backplane board 1 through connectors 6a-f, wherein circuit boards 5a-f not only may include a memory

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board but also include a processor board (col.3: 29-31) for performing the data processing functions.

III. Since both Marketkar et al. and Ishibashi et al. disclose an electronic system wherein circuit boards that perform electronic functions are mounted to a backplane through connectors, then including a processor board among the functional boards for performing the data processing functions, as taught by Ishibashi et al., would have been readily recognized in the pertinent art of Marketkar et al.

IV. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to mount various types of functional boards to the bus on the backplane board in the electronic system of Marketkar et al., including a processor board, as taught by Ishibashi et al., for performing the data processing in the electronic system of Marketkar et al.

Allowable Subject Matter

8. Claims 1-7 and 9-15, 25-26 and 27-31 have been allowed.

9. The following is a statement of reasons for the indication of allowable subject matter in view of Applicant's instant Amendment cited above:

As to Claims 1-7 and 9-15, patentability resides in the limitation wherein the connector comprises *a rigid coupling element, and the first electromagnetic coupler is formed on a surface of the rigid coupling element*, in combination with the other limitations of base Claim 1.

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As to Claims 25-26, patentability resides in *using a force that causes viscous material to be squeezed and to flow to fill air gaps between the sockets and the circuit board*, in combination with the other limitations of base Claim 25.

As to Claims 27-31, patentability resides in *a viscous liquid on the first electromagnetic coupler*, in combination with the other limitations of base Claim 27.

Response to Arguments

10. Applicant's arguments filed January 20, 2004 have been fully considered but they are not persuasive with respect to the 35 USC § 102(e) rejections of Claims 16-18 and 21-24 over Marketkar et al., and the 35 USC § 103(a) rejections of Claims 19 and 20 over Marketkar et al. in view of Benham et al. and Marketkar et al. in view of Ishibashi et al., respectively.

The Applicant has amended independent Claims 16, 21 and 23 to further limit the sockets be rigid sockets. However, the sockets 700 of Marketkar et al. are clearly rigid structures whose rigid walls support both the electromagnetic coupler (i.e., flex circuit 354) and the embedded contacts 750 and 760 that electromechanically secure and connect the device boards 352 plugged into the sockets (Figs. 13-16; p.6: [0086] and p.8: [0106]). Accordingly, amended independent Claims 16, 21 and 23 remain rejected over Marketkar et al. in the instant amended Application.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pechstein et al. (US 6,705,898 A2) discloses, in Fig. 1, a socket element 5 having an electromagnetic coupling element 9, and a plug element 4 having an electromagnetic coupling element 8 for power supply transmission by inductive coupling therebetween (col.5: 31-54); similarly, in Fig. 2, the electromagnetic coupling elements (14b,15a) on socket element 5, and (14a,15b) on socket element 4 perform power supply transmission inductively or capacitively (col.6: 48-49). Pechstein et al. does not teach or suggest a circuit board with plural electromagnetic couplers defined at locations along a bus and plural sockets (as described, above) mounted on the circuit board for electromagnetic coupling of signals with the board couplers.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

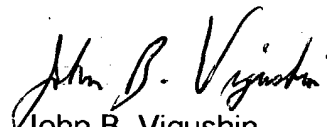
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Vigushin whose telephone number is 571-272-1936. The examiner can normally be reached on 8:30AM-5:00PM Mo-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


John B. Vigushin
Primary Examiner
Art Unit 2827

jbv
April 16, 2004